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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/441,380	11/16/1999	JERRELL P. HEIN	75622.P0007	4250

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EXAMINER	
SINGH, RAMNANDAN P	
ART UNIT	**PAPER NUMBER**
2644	6

DATE MAILED: 12/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/441,380	HEIN, JERRELL P.	
	Examiner	Art Unit	
	Dr. Ramnandan Singh	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 25 September 2003 have been considered but are moot in view of the new ground(s) of rejection. Further, in view of the finding of new art, the indicated allowability of Claims 9-19 is withdrawn.

Specification

2. In view of the applicant's response, the objection to the abstract is withdrawn.

3. **Status of Claims**

Claim 1 is amended.

Claims 1-16 are pending.

Claim Objections

4. Claim 13 is objected to because of the following informalities:

Claim 13 recites a limitation "a signal processor having **sense inputs**" on page 24, line 2. This is incorrect. Replace the term "**sense inputs**" with the term "**sensed inputs**".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Halbig [4,856,059].

Regarding Claim 13, Halbig teaches a signal processor 26 (i.e. a microprocessor) having sensed inputs for sensing a tip line and a ring line of a subscriber loop shown in Fig. 2 to generate subscriber loop control signals. A temperature responsive device T, such as a thermistor or bi-impedance polyswitch is mounted in heat conducting relationship with one or more of the resistors R_{s1}, R_{s2}, R_{f1}, and R_{f2}, as schematically represented by the heat conduction paths Q and Q' (dotted – line illustration) between R_{f1} and R_{f2} [Fig. 2; col. 4, lines 23-47]. Further, Halbig teaches a linefeed driver comprising a microprocessor 26, a cutoff relay 20 which is connected in the subscriber loop and is controlled by a relay driver 22 to disconnect the subscriber loop from the subscriber interface circuit 16 shown in Fig. 2 [col. 3, line 67 to col. 4, line 22]. The linefeed drive includes a tip series-coupled resistor, R_{f1} to the tip line and a ring series-coupled resistor, R_{f2}. In conventional subscriber interfaces, these resistors, R_{f1} and R_{f2} are used as fuses [col. 6, line 4 to col. 7, line 34].

Regarding claim 14, Halbig teaches taking a first voltage measurement before the fuse location and a second voltage measurement after the fuse for the TIP circuit. Since the fuse contains a constant resistance, the difference in the two voltage measurements is proportional to the TIP current. A similar thing holds for RING measurements [Halbig: Fig. 2].

Claims 15-16 are essentially similar to Claim 13 and are rejected for the reasons stated above.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang [US 5,881,130] in view of Kaplan [US 4,355,341].

Regarding claim 1, sensing and sampling of a TIP signal and a RING signal are well-known in the art. For example, Zhang teaches a method and apparatus for sampling a TIP signal and a RING signal for use by the signal processor 214 of a telephone line. Fig. 1 shows a switched telephone network, wherein lines TIP and RING run to switch 114, and are connected to one of the subscriber lines 112A or 112B. Further, Fig. 2 shows a portion 200 of measurement unit 116 comprising

interface and control circuitry 212 and detection circuit 210. The detection circuit 210 includes microprocessor circuitry 214 which may be a general purpose signal processor [col. 3, lines 29-39]. Current amplifier 224 and voltage amplifier 226 are coupled to the TIP and RING lines, wherein the outputs of current amplifier 224 and voltage amplifier 226 are provided to Analog to Digital Converter (ADC) 222. The ADC 222 converts the current and voltage signals into digital forms and passes the **samples** to microprocessor 214 [col. 3 line 66 to col. 4, line 48], wherein **the samples are stored in memory in microprocessor circuitry 214 for later processing** [Figs. 2, 3; col. 8, lines 34-37]. It may, however, noted that, later on, these samples can also be used **in the process of** determining an instantaneous power dissipation of the line component

Zhang does not teach expressly calculating the instantaneous power of a linefeed component and thereafter, applying this instantaneous power to determine a semiconductor junction temperature. However, it may be noted that the method of determining the temperature of a power device using the instantaneous power dissipation is well-known in the art.

Kaplan teaches calculating an instantaneous power dissipation of a transistor, a linefeed component [col. 1, lines 19-39; col. 2, lines 15-38], and determining the junction temperature of this semiconductor linefeed component. **Further, it has been noted that the voltage across a semiconductor is proportional to the logarithm of**

the current therethrough. It is also noted that such voltage is proportional to temperature [Kaplan; col. 4, lines 60-63].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the temperature determining technique of Kaplan using the instantaneous power dissipation of a power component with the current and voltage samples stored in the microprocessor 214 of Zhang.

The suggestion/motivation for doing so would have been to limit the power dissipation in an output transistor in order to protect such transistor from damage [Kaplan; col. 1, lines 11-13].

Claim 5 is essentially similar to Claim 1 and is rejected for the reasons staed above.

Claim 7 is also essentially similar to Claim 1 except for an analog-to-digital converter (ADC) for sampling at least one of a Tip signal and a RING signal. It may, however, noted that Zhang teaches an ADC 222 for sampling at least one of a Tip signal and a RING signal shown in Fig. 2.

Regarding claims 2, 6 and 8, Kaplan teaches a threshold comparator 16 to compare the voltage sum on conductor 30 to a reference potential V_{REF} supplied on

conductor 28 for protecting transistor Q_P. This threshold voltage represents an alarm temperature the component [Figs. 1-3; col. 2, lines 4-14; col. 2, lines 32-42; col. 4, lines 44-49; col. 5, lines 3-9].

Regarding claim 3, Zhang teaches an interface and control circuitry 212 that provides an **interface** to switch 114. As a result, the combination of Zhang and Kaplan can monitor each linefeed component connected to the subscriber loop interface.

Regarding claim 4, Zhang teaches microprocessor circuitry 214 that is programmable [Zhang; col. 9, lines 19-32].

9. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Zhang and Kaplan as applied to claim 7 above, and further in view of Gold et al [US 5,488,631].

Regarding Claim 9, the combination of Zhang and Kaplan does not teach expressly using a multiplexer coupling for a telephone line. It may, however, be noted that using multiplexed telephone signals for telephonic communications is well-known in the art.

Gold et al teaches using a microprocessor which is a 8-bit general purpose micro-controller integrated circuit (IC) chip providing all functions not directly part of user

communication data. These functions include a multiplexed high-speed 8-bit analog-to-digital conversion (ADC) capability for processing filtered analog signals to digital values [col. 9, lines 7-40].

Zhang , Halbig, and Gold et al are analogous art because they are from a similar problem solving area, viz. , telephonic communications.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide the multiplexer coupling of Gold et al with the microprocessor 214 of Zhang.

The suggestion/motivation for doing so would have been to provide the ability to the combined system of Zhang and Kaplan with a given bandwidth, to transmit more data and more free of interference from other types of devices [Gold et al; col. 1, lines 32-50].

Regarding Claim 10, Gold et al teaches time-division multiplexing communications systems to accommodate all the functions which can support a higher data rate [col. 1, lines 9-31; col. 2, lines 5-12].

Regarding claim 11, Gold et al teaches a microprocessor which is an 8-bit processor integrated circuit (IC) chip [col. 9, lines 609].

Regarding claim 12, Gold et al teaches a non-volatile memory (NMRAM) wherein parameters and a program could be stored [col. 9, lines 19-30].

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Chiozzi [US 5,917,382] teaches a method of sensing instantaneous power dissipated through a transistor [Entire document]; and

(ii) Fachinetti et al [US 4,727,450] teaches measuring instantaneous power dissipated in a circuit [Figs. 1-8; col. 2, lines 24-54; col. 3, lines 34-41].

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Ramnandan Singh whose telephone number is (703)308-6270. The examiner can normally be reached on M-F(8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester Isen can be reached on (703)-305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-0377.

Dr. Ramnandan Singh
Examiner
Art Unit 2644

December 5, 2003

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SUPERVISORY PATENT EXAMINER
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